DOCUMENT RESUME

ED 334 180 SP 033 170

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TITLE Patterns of Use of an Electronic Communication Network for Student Teachers and First Year Teachers.
PUB DATE 91
NOTE 12p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College School Cooperation; *Computer Networks; *Electronic Mail; Elementary Secondary Education; Helping Relationship; Higher Education; *Information Networks; Mentors; Preservice Teacher Education; Program Evaluation; *Student Teachers; Teaching Experience
IDENTIFIERS Experienced Teachers; *Iowa State University

ABSTRACT

The professional isolation of educators, and particularly of new teachers, has long been a problem. A number of colleges and universities have attempted to address this problem by establishing computer networks that link experienced teachers in classrooms with beginning teachers. The College of Education at Iowa State University has established the Electronic Education Exchange, a pilot project designed to investigate the implementation of an electronic communication network for new teachers. Although getting the participants to use the system was an initial problem, specific motivation techniques facilitated the use of the system during the second half of the project. Data on use of the system suggested the following trends: student teachers communicated most frequently with other student teachers; private messages were used almost 10 times as frequently as public messages; both day and evening hours were popular times to use the system. In general, participants were positive about the experience and indicated an interest in using a similar system during their first year of teaching. Further research needs to address the specific uses of the system and the contributions of these experiences to the effectiveness of the classroom teacher. Four tables display the data; the tables are accompanied by explanations and discussion. (AMH)

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Patterns of Use of an Electronic Communication Network for Student Teachers and First Year Teachers

by

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The Problem

The professional isolation of educators has long been a problem. Dan Lortie describes the "egg crate" nature of teaching, referring to the fact that typically, teachers are isolated in their classrooms and little opportunity for interaction with other teachers and experts in their fields [1]. Supporting Lortie's findings, reports that teachers are generally confined to their classrooms and are unable to converse with other educators about problems or concerns [2].

The isolation problem is particularly acute for new teachers. Many times, new teachers are hesitant to ask the experienced teachers for help and the veteran teachers are reluctant to offer their assistance [3]. Usually, it is difficult for these first year teachers to communicate with the people who have trained them in the university. Thus, beginning teachers are often left to solve problems on their own. Lortie attacks the abrupt transition into teaching when he states, "compared with the crafts, professions and highly skilled trades, arrangements for mediated entry are primitive in teaching" [1].

Existing Electronic Communication Systems for Educators

Recently, a number of colleges and universities around the country have attempted to address the problem of isolation of new teachers by establishing computer networks that link experienced educators at universities and in classrooms with beginning teachers. The experienced educators on the systems act as mentors for the beginning teachers by providing support and offering guidance on topics of concern. The beginning teachers can also communicate with each other and discuss shared problems or concerns. Ideally, the networks are designed to act as support systems for beginning educators.

The College of Education at the University of Michigan is currently implementing a project to serve this purpose [4,5]. This project involves the linking of 80 student teachers in the field with outstanding teachers and administrators and the University of Michigan faculty. The participants communicate with each other by accessing the university's mainframe computer with personal computers and modems and entering messages that are transmitted over the phone lines and saved on the mainframe for other users to access. The participants may send and receive private messages addressed to specific individuals or they may post and respond to public messages of general interest to all users on the system. Similar projects are being implemented at the University of Arizona [6], California State University [7] and the University of Alaska [8].

Although there are an increasing number of new teacher communication networks being established in Colleges of Education around the country, the published descriptions of these systems are general and do not include specifics about the implementation and use of the systems. Although the capabilities of electronic network systems seems a natural solution to help address teacher isolation, some systems designed for this purpose are not actively used and some have failed due to lack of use. If technology is to be used effectively in this area, it is important that we begin to understand the evolution of use of such systems and some of the challenges involved in making such a system work. In this paper, the establishment and

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utilization of an electronic network system for new teachers is described. Both procedures for establishing the system and data on the use of the system are included.

The Electronic Education Exchange at Iowa State University

The College of Education at Iowa State University is currently pilot testing three electronic network systems for educators and has been gathering data on the use of these systems. The initial system was established in Fall, 1988 and is designed for student teachers from the university. On this system, student teachers can communicate with other student teachers, Iowa State faculty, and experienced teachers. A similar system was set up simultaneously for first year superintendents in Iowa; this system includes the first year superintendents, Iowa State faculty in Educational Administration and selected experienced superintendents. In the Fall of 1989, selected first year teachers in Iowa schools were added to the existing student teacher system. These first year teachers were a part of a quality circle programming that included monthly face-to-face small group meetings with Iowa State faculty in addition to the electronic communication. This paper will focus on the student teacher portion of the project.

The host computer for the system is a Macintosh SE located in the College of Education at Iowa State University; this host uses Red Ryder software. There is an 800 number for the system that is good throughout the state of Iowa; at present, there is only one phone line into the system. The system is wet up to handle both public and private messages. Because ease of use was an important feature for the project, the system is designed to be as user-friendly as possible. Although the system does allow for file transfer, initial training to use the system only included information of sending and receiving messages. After users gain experience on the system, the file transfer capabilities are explained to them.

A graduate student acts as the system operator for the EEE and spends approximately 20 hours a week monitoring the system, training users, ensuring that messages are handled, and answering user problems. The system operator also makes visits to schools if users are having trouble getting started.

All three systems were designed with the following goals in mind:

1. Provide means for convenient information exchange among new educators, experienced Iowa educators and Iowa State University faculty
    a. Make experience and expertise readily available to new educators
    b. Increase faculty awareness of problems encountered by new educators; increase faculty ties to the field
    c. Decrease sense of isolation oven encountered by new teachers
2. Provide useful electronic networking experience for new educators
3. Observe, monitor and evaluate the initial use of the system; modify the system given formative evaluation information

In addition to connecting new educators with faculty expertise, the network is designed to make experienced classroom teachers and practicing superintendents available to the novices. The three-pronged approach is designed to help link College of Education faculty to the world of practice, as well as to make their expertise available to new educators. Ideally, faculty, experienced teachers and new teachers all have the opportunity to interact on areas of concern for the new teachers. Certainly, each participant in such a discussion should be learning from the perspective of the other.

Evaluation Procedures

Evaluation for the project was designed to measure the amount and type of use that new educators were making of the system. Student teacher users were given a pre-test to measure

certain background characteristics including previous computer experience and attitudes toward computer use in the classroom. At the end of the student teaching experience, the student teacher users were given a second instrument designed to measure their use of the system and their suggestions for improvement in the system. The post-test also included computer attitude items from the pre-test. Since some of the student teachers did not have access to the system because of lack of hardware or telephone lines in their schools, 30 student teachers were selected as the pilot group for evaluation. These 30 student teachers were all in schools that had a complete set of equipment available for them. Data reported from the project is from this selected pilot group. All data reported in this paper were from these selected student teachers, with the exception of the usage data in Figures 1 and 2; these usage data were collected from all the system users over a six month period.

Similarly, faculty users were asked to complete a questionnaire on their use of the system at the end of its first semester of operation. Also, faculty who used the system the most and those who used the system the least were interviewed.

In addition, all messages from the system were examined each week and information on users, types of messages, speed of response was recorded. By the end of the semester, we had a complete record and classification for every message that had been sent on the system.

Initial Challenges for the System and Responses to These Challenges

Potential student teacher participants in the project received introductory training on using the system at a meeting prior to their first student teaching assignment. At the meeting, each student teacher received instructions for logging on to the system. Following this meeting, however, very few of the student teachers actually logged into the system and for the first half of the student teaching semester, the system received very little use.

Many of the schools in which the students were teaching did not have a computer/modem set up that the students could use. A surprising number of schools had the hardware necessary, but did not have it set up to use. Project staff contacted many of the participating schools and made on-site visits to assist in setting up the systems.

When the student teachers returned to campus to receive their assignments for the second half of the semester, a second training session for the Electronic Education Exchange was held. At this session, students filled out forms that were then used to sign the students onto the system. After the students were signed on, they were assigned a partner. The assignment of partners was done so that students would immediately have someone to talk to on the system. The partner was another student teacher who was teaching at about the same grade level. Students were also assigned a faculty partner at this time.

In addition to the assignment of partners, special conferences were initiated on the system after the second meeting with the student teachers. The purpose of the conferences was to provide a special place on the system where student teachers could talk about particular ideas. The first conference was on classroom management; after that conference had been operating for a few weeks, a second conference on parent interactions was started.

At the second meeting, students were also given software that would allow them to access the system. The software was set up so that students would only have to choose "EEE' from an existing menu and would not have to enter the phone number themselves.

After the second meeting, use of the system picked up dramatically. Within one week, the phone line was regularly busy from 3:15-5:00 pm each day as student teachers used the system after school. Student teachers were talking with each other, Iowa State University faculty,

Area Education Agency specialists and experienced teachers. Topics ranged from classroom management issues to curriculum issues to job inquiries. It ap;peared that the techniques employed at the second training session encouraged student teachers to make more use of the system.

It is important to note that after the second meeting, however, about half the student teachers were not able to access the system. Most of these students did not have a phone line or modem available for use. In many of the smaller elementary schools, there was only one line coming into the building and this line was not able to support the modem.

We also discovered that merely making the system available was not enough to get students using the system. Pairing students with each other and with faculty, creating special interest conferences, on-site visits to schools and handing out software set to dial the system were all significant motivators for getting students started. Once students started to use the system, most were enthusiastic about it and only complained that they did not have enough time to get on it. Results from the questionnaires indicated that those students who used the system the most were the most positive about the use and potential of the system.

Results

As indicted earlier, a record was kept of all the messages sent on the EEE during the pilot period. The data below are from the student teacher portion of the project. Table I summarizes the student teacher use of the system.

Table 1
System Usage Information
Second Eight Weeks of Student Teaching

Total Connect Time	72 hours 49 minutes
Total Number of Logins	460
Total Number of Users	58
Average Connect Time per Login	9 minutes
Average Number of Logins per User	7.93
Number of Private Messages	407
Number of Public Messages	53

An analysis of the EEE callerlog revealed that the average user called the EEE 7.93 times over the eight week period from October 18 to December 14. The average length of each call was nine minutes. During this eight week period, the total connect time for the fifty-eight users of the EEE was 72 hours and 49 minutes with a total of 460 calls. The total number of messages generated was 407 private messages and 53 public messages. These calculations included the student teachers, their supervisors, and the ISU faculty as the users of the EEE.

In addition, the content of the messages sent was analyzed and results are summarized in Table 2.

Table 2
Analysis of EEE Message Topics

Category	# of Messages
sharing of student teaching experiences with other student teachers	54
notification of student teaching and faculty partners - system operator	48
communication between student teachers and ISU faculty	39
communication between student teachers and their supervisors	20
communication between student teaching partners	20
new user introductions	12
communication between ISU faculty members	11
request for teaching ideas or activities for a particular subject	8
EEE conferences	6
request for information on teaching strategies	4
public announcements about events at ISU	4
communication between student teachers and their faculty partners	2

The most common type of interaction on the system was the conversation of student teachers with other student teachers. These interactions often included a discussion of the progress the student teachers had made toward completing the required unit and bulletin boards for student teaching and common problems the student teachers were encountering. Not counting the interactions with the system operator, the second most common type of interaction was between student teachers and faculty.

We were also interested in obtaining data on the times during a typical day that the system was most frequently used and which days of the week showed the most use. Data were collected from the system log and Figures 1 and 2 provide summaries of these data. Note that these data are for a longer time period that data previously reported and reflect activity of all the users of the system; other data reported in this paper is just for the student teacher users during the time period indicated.

Fig 1: Hourly report for EEE 11/18/89 to 5/18/90

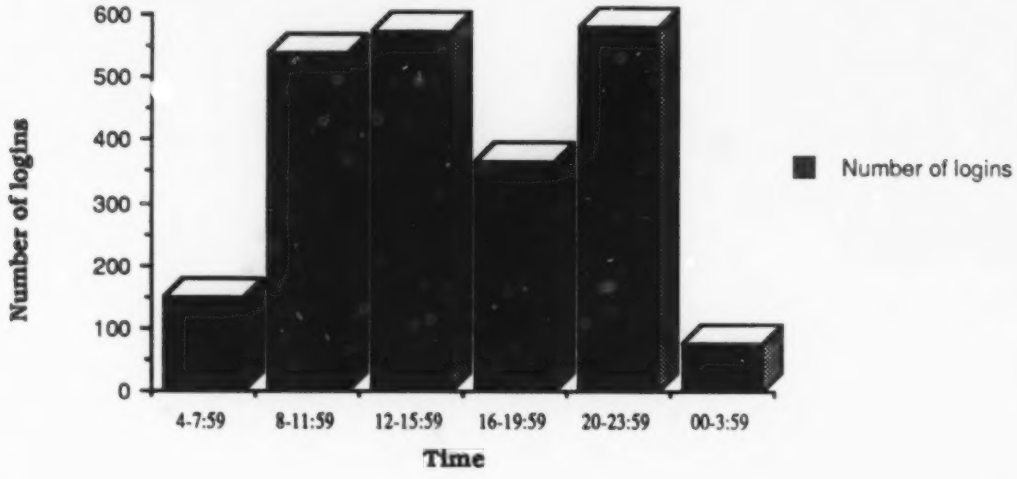

Figure 1 shows that system usage was high from 8 am until 4 pm and then dropped off slightly between 4 pm and 8 pm. The heaviest period of the 24-hour period was between 8pm and 12 pm at night.

Fig 2: Daily report for the EEE from 11/28/89 to 5/18/90

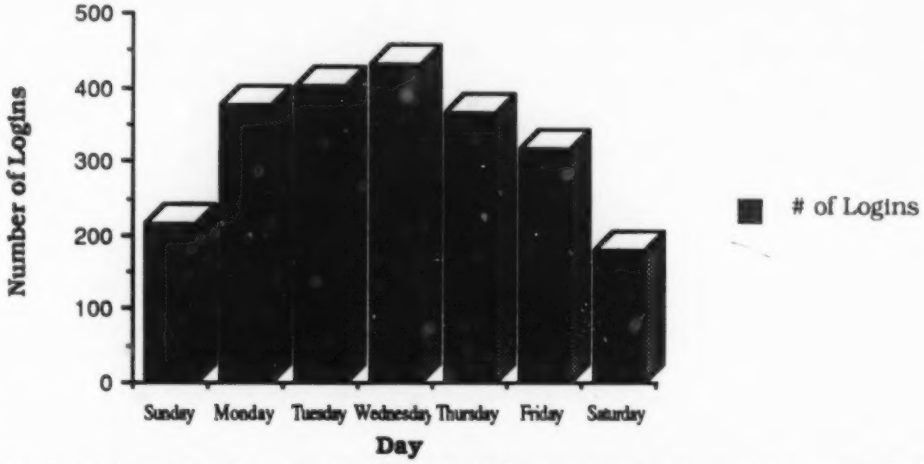

Figure 2 shows that the week day use was highest on Wednesday and lowest on Friday. The overall weekly pattern of use increases each day through Wednesday and then decreases at the end of the week. Week end use was much lighter, with Sunday use somewhat heavier than Saturday use.

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Because we were concerned with ease of use for the system, we also queried students about the training they had received for using the EEE. Results are summarized in Table 3 where 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree.

Table 3
Preparation for Using EEE

Question	N	Resp.	Freq.	%	Mean	S.D.
I received adequate training for utilizing the EEE.	28	1	13	46.4	1.86	1.15
		2	11	39.3		
		3	1	3.6		
		4	1	3.6		
		5	2	7.1		
I had difficulty with the computer in my school when I used it to call the EEE.	28	1	6	21.4	3.39	1.62
		2	4	14.3		
		3	1	3.6		
		4	7	25.0		
		5	10	35.7		
I had difficulty connecting with the EEE because the phone line was busy.	28	1	9	32.1	2.39	1.37
		2	9	32.1		
		3	3	10.7		
		4	4	14.3		
		5	3	10.7		
I found the EEE system to be easy to use.	28	1	13	46.4	1.96	1.20
		2	8	28.6		
		3	4	14.3		
		4	1	3.6		
		5	2	7.1		
I felt the directions for the EEE were unclear.	28	2	2	7.1	4.10	0.92
		3	4	14.3		
		4	11	39.3		
		5	11	39.3		
The questions that I asked on the EEE were answered promptly.	28	1	6	21.4	2.32	1.07
		2	11	39.3		
		3	8	28.6		
		4	2	7.1		
		5	1	3.6		
I received adequate preparation for utilizing the EEE.	28	1	13	46.4	1.86	1.15
		2	11	39.3		
		3	1	3.6		
		4	1	3.6		
		5	2	7.1		

Overall, the student teachers indicated that they were satisfied with the preparation they had received for utilizing the EEE. They also expressed that they found the system to be easy to use and felt the directions for the EEE were clearly written. In addition, the student teachers indicated that they didn't have difficulty with the computer in their school when they used it to call the EEE and that the questions they asked on the system were answered promptly. The biggest problem in this area was the difficulty in connecting with the EEE because the phone line was busy.

When queried about the future of the EEE, most of the student teachers (84%) indicated that they thought the EEE should be continued. Three people out of the twenty-five who responded thought it should not be continued and one person was undecided. The student teachers were also asked if they would be interested in using the EEE during their first year of teaching. The results in the Table IV show that 60.7% of the student teachers would be interested in using the EEE during their first year of teaching, while 21.4% were undecided and 17.8% would not be interested in using the system.

Table 4

Question	N	Resp.	Freq.	%	Mean	S.D.
I would be interested in using the	28	1	10	35.7	2.32	1.33
EEE during my first year of teaching.		2	7	25.0		
		3	6	21.4		
		4	2	7.1		
		5	3	10.7		

The student teachers were also asked to offer suggestions for future modifications to the EEE. The most frequent suggestion was to get more phone lines coming into the host system to handle all of the callers. The second most popular response was to introduce the student teachers to the EEE earlier in their college career so they were more familiar with it by the time they were student teaching. The reasoning behind this seemed to be that they were very busy during student teaching and would appreciate the system more if they were already comfortable with it.

The faculty and supervisors were also asked if they felt the EEE should be continued. Most of them (75%) felt that the system should be continued. Faculty indicated that they needed more access to the system and that using the system in student laboratories was not adequate for the faculty. When asked about the advantages of the EEE, the most common response was the improved communication between student teachers in the field and university personnel. The faculty and supervisors also felt that the system demonstrated an excellent application of telecommunications to the student teachers and helped them to learn how to use the technology. The faculty and supervisors indicated that the greatest disadvantages of the EEE were the shortage of terminals to connect with the system and the limitation of only having one phone for incoming calls on the host computer. When asked for their suggestions for improving the EEE, the faculty and supervisors indicated that their main concern was the need for more hardware in the schools and at the university to support the project.

Student teacher attitudes toward technology were also measured before and after the project. The attitudes as measured became significantly more positive after the EEE experience. Given that there was no control group, however, it is difficult to attribute causality to the project at this point.

Discussion

The pilot experiences for the Electronic Education Exchange suggest promising, yet challenging, possibilities for the use of electronic communication systems to link new teachers to colleges of education, experienced teachers and each other. Although getting the project off the ground initially was difficult, the majority of student teachers participating in the project were enthusiastic about the professional linkages that the system enabled and were willing to continue using such a system in the future. Participating students also indicated an increased desire to use technology with their own students.

Faculty involved with the project were generally enthusiastic about the possibilities of the network. Some of the faculty had made little previous use of the computer and seem to findd the ease of use of the telecommunication network empowering. It became clear, however, that faculty needed to have computers available in their offices in order to regularly answer messages and use the system.

At the beginning of the project, it became obvious that merely setting up such a network and teaching students to use it was not enough to get the students to use the system. Techniques that appeared successful in getting the system started included pairing students with other students, pairing students with faculty, initiating conferences of special interest to the student teachers, conducting face-to-face meetings with the student teachers and making on-site visits to demonstrate the system in the students' schools.

Data colected the year following this initial study, however, indicate that use increases during he second eight weeks of the student teaching experience even if pairing and conferences are initiated duirng the first eight weeks. It seems that the student teachers are more ready to try the electronic communiction network after they have met the challenge of the first few weeks of student teaching.

Many of the Iowa schools used for the project were not adequately equipped for using the electronic bulletin board. About half did not have modems or available phone lines. While the modem problem is a relatively easy one to address, the phone line problem is going to require attention. Unless schools update their phone systems, many students around the country will not have opportunities to access central bulletin board and data base systems, in addition to teachers not having the opportunity to communicate with other teachers.

On the post-test, the student teachers indicated an increased desire to use technology in their teaching. It is possible that one of the benefits of such a system is that it helps teachers become comfortable with using electronic communications and thus more able to utilize the capability with their own students. Other research on teachers using technology suggests that at the initial level, teachers must first use the technology for their own needs. Certainly an electronic teacher network is an example of using technology for the needs of the teacher' further research needs to be done to see if these experiences do in fact encourage teachers to use telecommunication in their teaching.

Usage patterns for the system reveal trends transferable to others attempting to set up systems and understand electronic communication patters. Although the public mail capability of the system offers unique communication possibilities for educators, the new users use private mail much more than public mail. It appears that users must be encouraged to discover the capabilities of public mail and that the use of this part of the system must be facilitated for new users.

The fact that student teachers communicated most with other student teachers is a second interesting finding. Clearly, one of the major purposes of the system was to facilitate communication among student teachers, faculty and experienced educators. The data suggest, however, that further intervention may be necessary to encourage the student teachers to communicate with faculty and experienced teachers. It seems likely that student teachers learning to use the system may be most comfortable talking to each other and that perhaps communication patterns with faculty and experienced teachers might increase as student teachers become increasingly familiar with the system.

The trends from the time usage patterns also offer interesting information for educators. One surprising finding is that the system receives heavy use in the late evening. Since many of the teachers and student teachers who use the system do not have computers at home, the data suggests that those who do find the evening hours a good time to carry on their professional communications. Districts interested in encouraging this type of communication might want to make hardware available to teachers in the evenings.

Future plans for the system include expanding the number of phone lines, using the file transfer capabilities to send materials to new teachers, obtaining increased faculty access to the system and expanding the number of experienced teachers on the system. The EEE is also now introduced to students earlier in their teacher education program. Freshmen and sophomore students are now introduced to the EEE in the beginning educational computing class and some juniors use the system as part of their pre-student teaching field experience or as part of a more advanced educational computing class. Data now being collected indicate that these experiences may increase the use of the system by student teachers.

Characteristics of early adopters of the EEE are also currently being studied. Through gaining an understanding of these early adopters, their perceptions of the system and their characteristics, the diffusion process may be stimulated.

Summary

The Electronic Education Exchange is a pilot project designed to investigate the implementation of an electronic communication network for new teachers. The project was designed to help improve the professional isolation of student teachers and to strengthen linkages between the new teachers in the field and the university. Although getting the participants to use the system was an initial problem, specific motivation techniques facilitated the use of the system during the second half of the project. Data on use of the system suggested the following trends: student teachers communicated most frequently with other student teachers; private messages were used almost ten times as frequently as public messages; both day and evening hours were popular times to use the system. In general, participants were positive about the experience and indicated an interest in using a similar system during their first year of teaching. Further research needs to address the specific uses of the system and the contributions of these experiences to the effectiveness of the classroom teacher.

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